

What is claimed is:

1. A display for displaying an image according to pixel data of every pixel based on an input image signal, comprising

a display panel having a front substrate and a rear substrate arranged at opposite positions for interposing a discharge space therebetween, a plurality of pairs of row electrodes provided on an inner surface of the front substrate, a plurality of column electrodes arranged on an inner surface of the rear substrate in a way of intersecting with the pairs of row electrodes, and light-emission areas formed at each intersection of the row electrode pairs and the column electrodes, each of the light-emission areas consisting of a first discharge cell including a portion where the respective row electrodes in pair are opposed to each other with a first discharge gap in the discharge space and a second discharge cell including a portion where a light absorptive layer is provided on the front substrate's side and one row electrode of the row electrode pair and the other row electrode of the row electrode pair adjacent to the above row electrode pair are opposed to each other with a second discharge gap, and

an address component for producing an address discharge within the second discharge cell selectively by applying a pixel data pulse based on the pixel data, to the respective column electrodes, while applying a scanning pulse to a row electrode having the longer distance to the first discharge cell, of the respective row electrodes within the second

discharge cell, thereby setting the second discharge cell at a light-on state or a light-off state.

2. The display according to claim 1, further comprising

a priming expansion component for expanding a discharge toward the first discharge cell to set the first discharge cell at a light-on state, by applying a priming pulse alternately to the respective row electrodes within the second discharge cell to cause a priming discharge only in the second discharge cell that is in the light-on state, and

a sustain component for repeatedly applying a sustain pulse alternately to the respective row electrodes within the first discharge cell to cause a sustain discharge only in the first discharge cell that is in the light-on state.

3. The display, according to Claim 1, wherein

the second discharge gap is formed at a position deviated from a medium position between the respective row electrodes within the second discharge cell toward the first discharge cell.

4. The display, according to Claim 1, wherein

each of the row electrodes in pairs has a main body extending in a horizontal direction of the display panel and a protrudent portion protruding from the main body in a direction perpendicular to the horizontal direction in each unit light emission area,

the first discharge cell includes a portion where the protrudent portions of the respective row electrodes in pair are opposed to each other with the first gap within the

discharge space, and

the second discharge cell includes a portion where the protrudent portion of one row electrode of the row electrode pair is opposed to the protrudent portion of the other row electrode of the row electrode pair adjacent to the above row electrode pair with the second gap within the discharge space.

5. The display, according to Claim 1, wherein

the discharge spaces of the respective second discharge cells adjacent in the horizontal direction of the display panel are blocked by each other and the discharge spaces of the respective first discharge cells adjacent in the horizontal direction of the display panel communicate with each other.

6. The display, according to Claim 1, wherein

in the light-emission area, the first discharge cell is divided from the second discharge cell by a partition wall formed on an inner surface of the rear substrate and the discharge space of the first discharge cell communicates with the discharge space of the second discharge cell through an interstice between the partition wall and the front substrate.

7. The display, according to Claim 1, wherein

a phosphor layer of emitting light by a discharge is formed only within the first discharge cell.

8. The display, according to Claim 1, wherein

a second electron emissive layer is formed on the rear substrate within the second discharge cell.

9. The display, according to Claim 1, further comprising

a reset component for producing reset discharges within the second discharge cells of all the light-emission areas, prior to the address discharge, by applying a reset pulse between the row electrode having the longer distance to the first discharge cell, of the respective row electrodes within the second discharge cell, and the column electrode, so as to make the column electrode at a lower potential.

10. The display, according to Claim 9, wherein

the reset component performs the reset discharge to be produced within the respective second discharge cells belonging to odd display lines in the display panel and the reset discharge to be produced within the respective second discharge cells belonging to even display lines in the display panel, with time difference.

11. The display, according to Claim 1, wherein

the address component performs the address discharge to be produced within the respective second discharge cells belonging to the odd display lines in the display panel and the address discharge to be produced within the respective second discharge cells belonging to the even display lines in the display panel, with time difference.

12. The display, according to Claim 2, wherein

the reset pulse has a waveform of lower transition level than the sustain pulse, in rising and falling periods.

13. The display, according to Claim 9, wherein

the reset pulse has a waveform of lower transition level than the sustain pulse, in rising and falling periods.

14. The display, according to Claim 2, comprising  
an erase component for producing an erase discharge within the first discharge cell by applying an erase pulse to the respective row electrode pairs after completion of the sustain discharge.
15. The display, according to Claim 2, comprising  
a charge transition component for moving a wall discharge from the first discharge cell to the second discharge cell, by applying a charge transition pulse between one row electrode, of the respective row electrodes within the second discharge cell, and the other row electrode of the row electrode pair adjacent to the above row electrode, after completion of the sustain discharge, and discharging only the second discharge cell paired with the first discharge cell where the sustain discharge has been produced.
16. A driving method for driving a display panel according to pixel data of every pixel based on an input image signal, the display panel having: a front substrate and a rear substrate arranged at opposite positions for interposing a discharge space therebetween; a plurality of pairs of row electrodes provided on an inner surface of the front substrate; a plurality of column electrodes arranged on an inner surface of the rear substrate in a way of intersecting with the pairs of row electrodes; and light-emission areas formed at each intersection of the row electrode pairs and the column electrodes, each of the light-emission areas consisting of a first discharge cell including a portion

where the respective row electrodes in pair are opposed to each other with a first discharge gap in the discharge space and a second discharge cell including a portion where a light absorptive layer is provided on the front substrate's side and one row electrode of the row electrode pair and the other row electrode of the row electrode pair adjacent to the above row electrode pair are opposed to each other with a second discharge gap, the method comprising:

- an address stage for producing an address discharge within the second discharge cell selectively by applying a pixel data pulse based on the pixel data, to the respective column electrodes, while applying a scanning pulse to a row electrode having the longer distance to the first discharge cell, of the respective row electrodes within the second discharge cell, thereby setting the second discharge cell at a light-on state or a light-off state;

- a priming expansion stage for expanding a discharge toward the first discharge cell to set the first discharge cell at a light-on state, by applying a priming pulse alternately to the respective row electrodes within the second discharge cell to cause a priming discharge only in the second discharge cell that is in the light-on state; and

- a sustain stage for repeatedly applying a sustain pulse alternately to the respective row electrodes within the first discharge cell to cause a sustain discharge only in the first discharge cell that is in the light-on state.

17. The driving method of the display panel, according to

Claim 16, wherein

the second discharge gap is formed at a position deviated from a medium position between the respective row electrodes within the second discharge cell toward the first discharge cell.

18. The driving method of the display panel, according to Claim 16, wherein

each of the row electrodes in pairs has a main body extending in a horizontal direction of the display panel and a protrudent portion protruding from the main body in a direction perpendicular to the horizontal direction in each unit-light emission area,

the first discharge cell includes a portion where the protrudent portions of the respective row electrodes in pair are opposed to each other with the first gap within the discharge space, and

the second discharge cell includes a portion where the protrudent portion of one row electrode of the row electrode pair is opposed to the protrudent portion of the other row electrode of the row electrode pair adjacent to the above row electrode pair with the second gap within the discharge space.

19. The driving method of the display panel, according to Claim 16, wherein

the discharge spaces of the respective second discharge cells adjacent in the horizontal direction of the display panel are blocked by each other and the discharge spaces of the respective first discharge cells adjacent in the

horizontal direction of the display panel communicate with each other.

20. The driving method of the display panel, according to Claim 16, wherein

in the light-emission area, the first discharge cell is divided from the second discharge cell by a partition wall formed on an inner surface of the rear substrate and the discharge space of the first discharge cell communicates with the discharge space of the second discharge cell through an interstice between the partition wall and the front substrate.

21. The driving method of the display panel, according to Claim 16, wherein

a phosphor layer of emitting light by a discharge is formed only within the first discharge cell.

22. The driving method of the display panel, according to Claim 16, wherein

a second electron emissive layer is formed on the rear substrate within the second discharge cell.

23. The driving method of the display panel, according to Claim 16, further comprising

a reset stage for producing reset discharges within the second discharge cells of all the light-emission areas, prior to the address stage, by applying a reset pulse between the row electrode having the longer distance to the first discharge cell, of the respective row electrodes within the second discharge cell, and the column electrode, so as to make the column electrode at a lower potential.



24. The driving method of the display panel, according to Claim 23, wherein

in the reset stage, an odd row reset stage for producing the reset discharge within the respective second discharge cells belonging to odd display lines in the display panel and an even row reset stage for producing the reset discharge within the respective second discharge cells belonging to even display lines in the display panel are performed with time difference.

25. The driving method of the display panel, according to Claim 16, wherein

in the address stage, an odd row address stage for producing the address discharges within the respective second discharge cells belonging to the odd display lines in the display panel and an even row address stage for producing the address discharges within the respective second discharge cells belonging to the even display lines in the display panel are performed with time difference.

26. The driving method of the display panel, according to Claim 16, wherein

the reset pulse has a waveform of lower transition level than the sustain pulse, in rising and falling periods.

27. The driving method of the display panel, according to Claim 23, wherein

the reset pulse has a waveform of lower transition level than the sustain pulse, in rising and falling periods.

28. The driving method of the display panel, according to

Claim 16, comprising

an erase stage for producing an erase discharge within the first discharge cell by applying an erase pulse to the respective row electrode pairs after completion of the sustain discharge in the sustain stage.

28. The driving method of the display panel, according to Claim 16, comprising

a charge transition stage for moving a wall discharge from the first discharge cell to the second discharge cell, by applying a charge transition pulse between one row electrode, of the respective row electrodes within the second discharge cell, and the other row electrode of the row electrode pair adjacent to the above row electrode after completion of the sustain discharge in the sustain stage, and discharging only the second discharge cell paired with the first discharge cell where the sustain discharge has been produced.